

liable to produce this prejudicial effect, although they prevent the formation of white sand;—

And that carbonic acid appears particularly useful in cases where the irritability of the bladder forbids the use of other acid remedies.

*Additions to an Account of the Anatomy of the Squalus maximus, contained in a former Paper; with Observations on the Structure of the Bronchial Artery, By Sir Everard Home, Bart. F.R.S.* Read June 24, 1813. [*Phil. Trans.* 1813, p. 227.]

The author observes, that with respect to his former description of the external parts, he has no addition to make, excepting that, from the position of the fish at the time when it was drawn, a small fin was omitted between the anus and tail; which, however, is so far important, that some persons have on this ground imagined that the fish described was a different species of *Squalus*.

Of the internal parts, the stomach is now described, and a delineation given. The liver has six ducts; but these unite, before they enter the duodenum, in one common cavity, which corresponds to the dilatation of the common duct in those quadrupeds that have no gall-bladder.

A drawing is given of the heart and valves of the bronchial artery; and it is remarked, that the coats of this artery are muscular to some distance from the ventricle, the use of which is conceived by the author to be to aid in propelling the blood through the gills when impeded by the pressure of any great depth of water: for the same quantity of blood should pass through the gills at all depths, unless the water at greater depths contained a larger proportion of air; but this did not appear to be the case by direct experiment, in which the author was assisted by Mr. Brande.

In support of the opinion that muscularity of the coats of the bronchial artery is connected with the circumstance of living at great depths, the author remarks, that in the turbot and the wolf-fish, which live in shallow water, there is no muscular covering to the origin of the bronchial artery, but, on the contrary, its coats are so exceedingly elastic as to be easily dilated into a considerable reservoir.

In the *Lophius piscatorius*, the mechanism of the heart is such, that description alone could hardly convey an adequate idea of its form; and a drawing of its peculiarities is annexed.

In the tribe of Mollusca, other differences of muscularity occur from other causes. In the Terebines, where great muscular power is required for working the boring engine, the heart consists of two auricles and two ventricles, with valves of very great strength, to direct the current of the blood. But in the oyster, on the contrary, the heart has but one auricle and one ventricle; and in the muscle, the heart is scarcely divided into auricle and ventricle, but is a mere oval bag, through which the intestine passes, the peristaltic motion of which appears to the author to contribute as much to the motion of the blood as can be effected by the proper coats of the ventricle.

After this digression concerning varieties in the structure of the heart, the author resumes his anatomy of the *Squalus maximus*, and notices, among the peculiarities of the urinary passages, that there is no proper urinary bladder, but a cavity comparatively small, that is common to the urine and semen; since both the vasa differentia and ureters open into it at the distance of about four inches from each other.

The holders in the male *Squalus* have been noticed before; but it is now added, that in each holder is a canal, communicating with a cavity between the skin and muscles of the abdomen, which is stated to be eleven feet long and two wide. The surfaces of this cavity are white, and extremely smooth; and it contains a mucus more viscid than any known animal secretion.

Respecting the brain, it is remarked, that in the *Squalus*, as well as in fish in general, the cerebrum is wanting, unless the part from which the olfactory nerves arise be so called.

The eye is very small for the size of the fish; its largest diameter being not more than three inches, and its shortest only one inch and three quarters.

The straight muscles that surround the eye are so much stronger than would appear to the author requisite for moving so small a sphere, that he thinks such strength can only be required in adjustment of the eye for overcoming the stiffness of the sclerotic coat.

*Some further Observations on a new detonating Substance. In a Letter from Sir Humphry Davy, LL.D. F.R.S. V.P.R.I. to the Right Hon. Sir Joseph Banks, Bart. K.B. P.R.S. Read July 1, 1813. [Phil. Trans. 1813, p. 242.]*

In a second letter which the author received from France, he is informed that the detonating oil was there originally procured by passing a mixture of chlorine and azote through aqueous solutions of sulphate or muriate of ammonia; but from the method of obtaining it in this country, it is evident that the azote is unnecessary, as it is obtained by exposure of any ammoniacal salt in solution to mere chlorine. The oily fluid obtained by these means has the specific gravity of 1.653. It is not congealed by cold, as the author had formerly supposed, but remains fluid even when cooled by a mixture of ice and muriate of lime.

When kept in water, it gradually disappears, and the water becomes acid, having the taste and smell of weak nitro-muriatic acid.

Concentrated muriatic acid decomposes it, disengaging chlorine, and forming muriate of ammonia.

In concentrated nitric acid it gives out azote.

In dilute sulphuric acid it yields a mixture of azote and oxygen.

In a strong solution of ammonia it detonates; with a weak solution it yields azote.

With the muriates of sulphur and of phosphorus, or with sulphuret of carbon, it combines without any violence.